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Infringement and Software Claims Under 35 U.S.C. § 112 ¶ 6: Software Function is the Important Part

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I. Introduction

35 U.S.C. § 112 ¶ 6 (formerly 35 USC § 112 ¶ 3) allows claims to be expressed in a form other than by setting out the precise structure of the device to be used to achieve of the stated purpose. It provides that an "element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."

Software claims are particularly applicable to software's functional nature. Software is the functional nature by which computers are programmed to perform specific functions. Software is the functional nature by which computers are programmed.

The value of anything substituted through its equivalent is not determined by looking only at the functions which it is intended to perform, but also by considering the manner in which it performs the required function. Software claims are particularly applicable to software's functional nature. Software claims are particularly applicable to software's functional nature. Software claims are particularly applicable to software's functional nature

[46] *See* Genentech, Inc. v. Wellcome Found. Ltd., 29 F.3d 1555, 1565 (Fed. Cir. 1994).

[47] *See Warner-Jenkinson*, 520 U.S. at 39-40 (1997).

[48] *See Alpex*, 102 F.3d at 1222 ("Under Section 112, the concern is whether the accused device, which performs the claimed function, has the same or an equivalent structure as the structure described in the specification corresponding to the claim's means. Under the doctrine of equivalents, on the other hand, the inquiry is whether the accused device is only insubstantially different than the claimed device.") (internal citations omitted).

[49] *See* D.M.I. Inc. v. Deere & Co., 755 F.2d 1570, 1575 (Fed. Cir. 1985).

[50] *See* Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 934 (Fed. Cir. 1987) (if the identical function is not performed, literal infringement is not possible).

[51] *Warner-Jenkinson Co.*, 520 U.S. at 33-34.

[52] 16 F.3d 1189 (Fed. Cir. 1994).

[53] *See, e.g.*, Odetics Inc. v. Storage Technology Corp., 185 F.3d 1259 (Fed. Cir. 1999); Seal-Flex Inc. v. Athletic Track and Court Construction 172 F.3d 836 (Fed. Cir. 1997); Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420 (Fed. Cir. 1997); *O.I. Corp.*, 115 F.3d 1576; Cole v. Kimberly-Clark Corp., 102 F.3d 524 (Fed. Cir. 1996); *York Products*, 99 F.3d 1568; *Greenberg*, 91 F.3d 1580.

[54] 33 F.3d 1526 (Fed. Cir. 1994).

[55] *Id.*, at 1537-8.

[56] *Id.*

[57] *Id.*, at 1540-1.

[58] *Id.*

[59] 16 F.3d 1189, 1193 (Fed. Cir. 1994). The patent application related to an industrial air-filtering device (i.e., dust collector) which included a claim element covering "a lowermost portion . . . arranged and constructed for the collection of particulate matter, said portion having *means . . . for moving particulate matter in a downward direction to a bottommost point* . . . ." *Id.* at 1191 (emphasis added).

[60] *Id.*, at 1194-5

[61] *O.I. Corp.*, 115 F.3d at 1583.

[62] *See Hollister* v. *O.I. Corp.*, *supra*.

[63] *O.I. Corp.*, 115 F.3d at 1583.

[64] Johnston v. IVAC Corp., 885 F.2d 1574, 1580 (Fed. Cir. 1989) (. . . for a means-plus-function limitation to read on an accused device, the accused device must incorporate or perform means for performing the function disclosed in the specification or a *structural equivalent* of that means, plus it must perform the identical function. Section 112(6) can never provide a bases for finding that a means-plus-function claim element is met literally where the function part of the element is not literally met in an accused device.) (emphasis added).

[65] 35 U.S.C. § 112, ¶ 6.

[66] *See, e.g.*, DeGraffenried v. United States, 20 Cl.Ct. 458, 479-80 (1990):

[T]he term "equivalent" in Section 112 should not be interpreted as being limited to structures that are "equivalent" to the physical structure of the "means" disclosed in a patent. The literal wording of Section 112 contains no such requirement. The statute merely refers to structures "described in the specification and equivalents thereof." It does not state that the only possible "equivalents" to the structures described in the specification are devices with equivalent physical structures, i.e., it does not provide structures "described in the specification and structural equivalents thereof."

Judge Rich has expressed his position on the issue in *Baltimore Equip. Therapeutic Co. v. Loredan Biomedical, Inc.*, 26 F.3d 138, 1994 WL 124022, *7 (Fed. Cir. 1994) (non-precedential):

I can agree with the majority's generalized statement that to meet a means-plus-function limitation an accused device must perform the function named in the means clause "and perform that function using the structure disclosed in the specification or an equivalent structure." That is what § 112, ¶ 6 says. But that does not necessarily mean that a structural equivalent of what the specification discloses must be used. The two emphasized expressions sound very similar but they connote very different concepts and should not be confused.

[67] 885 F.2d 1574, 1580 (Fed. Cir. 1989).

[68] *See, e.g.*, Kegel Co., Inc. v. AMF Bowling, Inc., 127 F.3d 1420, 1428 (Fed. Cir. 1997); *Cole*, 102 F.3d at 533 (Rader, J., dissenting); *Alpex*, 102 F.3d at 1221; Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 1042 (Fed. Cir. 1993); *In re* Hayes Microcomputer Prods. Inc. Patent Litigation, 982 F.2d 1527, 1543 (Fed. Cir. 1992); *Intellecall*, 952 F.2d at 1388-9 ("substantial structural equivalent"); Intel Corp. v. U.S. I.T.C., 946 F.2D 821, 842 (Fed. Cir. 1991); *In re* Bond, 910 F.2d 831, 833 (Fed. Cir. 1990).

[69] *See, e.g.*, Brita Wasser-Filter-Systeme GmbH v. Recovery Engineering, Inc., 1998 WL 473467, *3 (N.D. Ill. Aug. 7, 1998); Stairmaster Sports/Medical Prods., Inc. v. Groupe Procycle, Inc. 1998 WL 290296, *6, *8 (D. Del. May 20, 1998); Cuisinart, Inc. v. Cuisbank Automated Sys., Inc., 998 F. Supp. 1109, 1123 (N.D. Cal. 1998); Howes v. Zircon Corp., 992 F.Supp. 957, 963 (N.D. Ill. 1998).

[70] *DeGraffenreid*, 20 Cl. Ct. at 480-81:

. . . limiting literal infringement of "means plus function" claims to objects that have physical structure equivalent to those objects specifically described in the patent specification could seriously undermine the usefulness of such claims. Under such an interpretation, literal infringement of a claim may be avoided simply by replacing the structures specifically described in the patent specification with known functional equivalents that operate in substantially the same way but have fundamentally different structures.

[71] *Id.*, at 481 (in order to escape the strictures of structural equivalency, "a patent owner would reasonably have to include in the patent specification an exhaustive list of structures that possibly could perform each function described in the claim.").

[72] *Warner-Jenkinson*, 520 U.S. at 28 ("Congress enacted § 112, ¶ 6 in response to *Halliburton*. . .."); *Halliburton*, 329 U.S. 1.

[73] *Halliburton*, 329 U.S. at 9 n. 7.

[74] *Id.*, at 9.

[75] *Valmont*, 983 F.2d at 1045 ("In particular, the Supreme Court [in *Halliburton*] feared that means-plus-function language was overbroad and ambiguous.").

[76] *Halliburton*, 329 U.S. at 12.

[77] Donald Chisum, CHISUM ON PATENTS, § 8.04[1]. Matthew Bender, 1997.

[78] In *Chiuminatta*, the alleged infringer argued that for an accused structure to be equivalent to a disclosed structure in the §112(6) sense, the accused structure "must include substantially all of the structure features" of the disclosed structure. Chiuminatta Concrete v. Cardinal Industries. Inc., 145 F.3d 1303, 1309 (Fed. Cir. 1998). The court did not explicitly endorse this test but seemed to apply it in its analysis. The *Chiuminatta* holding was reinterpreted in *Odetics*, where the Federal Circuit held that the determination of structural equivalents when deciding literal infringement under §112(6) hinges upon the "overall structure" disclosed, not the individual components within the structure. *Odetics*, 185 F.3d 1259.

[79] Baltimore Therapeutic Equip. Co. v. Loredan Biomedical Inc., 30 U.S.P.Q.2d 1672 (Fed. Cir. 1994) (Rich, J., concurring) ("The majority appears to me to take it for granted that the patentee must show "structural" equivalence to support a finding of infringement and that this is a requirement of the statute. . . . But structural equivalence is a requirement of the statute.")

[80] *See Id.*, at 1677.

[81] *Id.*

[82] *Id.*

[83] *Id.*

[84] *Id.*

[85] *Id.*, at 1677-8.

[86] The PTO established interim guidelines for examination of claims under §112(6), which became effective on July 30, 1996. Interim Supplemental Examination Guidelines for Determining the Applicability of 35 U.S.C. 112 P. 6, 64 Fed. Reg. 41, 392, 41, 392-4 (1999). The guidelines are intended to establish uniformity and to make the prosecution record clear as to when a claim element is being interpreted under §112(6). However, these guidelines have no precedential value in federal court.

[87] *See* Fonar Corp. v. General Electric Co., 107 F.3d 1543, 1548-50 (Fed. Cir. 1997) (The Federal Circuit held that the best mode requirement of 35 U.S.C. § 112, ¶ 1 for disclosing the software used in a magnetic resonance imaging invention was satisfied merely by describing the functions of the software without actually including in the specification either software program source code or process flow charts According to the court, writing software program code, whose function is disclosed in the specification, is normally within the capability of one skilled in the art to prepare without requiring undue experimentation); Robotic Vision System, Inc. v. View Engineering, Inc., 112 F.3d 1163, 1165-7 (Fed. Cir. 1997) (The Federal Circuit held that the best mode requirement in 35 U.S.C. § 112 ¶ 1 was not violated by a patent that did not use the word "software" when it was clear that using software was the only mode that existed for practicing the invention and that the use of software with this invention was plainly apparent to one skilled in the art).

[88] *See O+W Door*, 194 F.3d 1261. The Federal Circuit found that a figure that included a software-based embodiment was covered by the claim language "switch means." *Id.* at 1267-8. Further, the court used that figure to determine that the device of the alleged infringer constituted a different "structure" than the software disclosed in the patent. *Id.* at 1269-71. Based on a program flowchart in the figure, the court reasoned that the accused device uses a different algorithm to perform the recited function. *Id.* at 1273.

[89] *Fonar*, 107 F.3d 1543.

[90] *Robotic Vision Systems*, 112 F.3d 1163.

[91] U.S. Patent No. 4,871,966.

[92] *Fonar*, 107 F.3d 1543, 1549 (Fed. Cir. 1997). *See also In re Hayes Microcomputer*, 982 F.2d at 1537-38 (Fed. Cir. 1992) (stating that there was no best mode violation where the specification failed to disclose a firmware listing or flow chart, but did disclose sufficient detail to allow one skilled in the art to develop a firmware listing for implementing the invention.); *In re* Sherwood, 613 F.2d 809, 816-17 (C.C.P.A. 1980).

[93] U.S. Patent No. 5,463,227.

[94] *Robotic Vision Systems*, 112 F.3d at 1166.

[95] *See* Keith Stephens & John P. Sumner, *Patenting Software Objects And Other Aspects of Object-Oriented Programs Under The New PTO Guidelines*, 23 AIPLA Q.J. 221, 258 (1995) ("The crux of a software object invention is in the software structure.").

[96] *See id.*, at 226.

[97] A good example of a program that is readily written in object code is a menu in a graphical user interface. *See id.*, at 249-57.

[98] *Id.*, at 226.

[99] *Id.*

[100] *Id.*

[101] *Id.*

[102] *Id.* Also, "an important aspect of object-oriented programming is the framework approach to application development." *Id.* Ralph E. Johnson & Vincent F. Russo, *Reusing Object-Oriented Designs*, University of Illinois Tech. Report UIUCDODS91-1696 (1991) ("An abstract class is a design of a set of objects that collaborate to carry out a set of responsibilities. Thus, a framework is a set of object classes that collaborate to execute defined sets of computing responsibilities.").

[103] Johnson & Russo, *supra* note 102.

[104] Richard H. Stern has proposed a regime for protecting computer-related abstract ideas, such as algorithms, programming languages, and instructions sets. Richard H. Stern, *On Defining The Concept of Infringement Of Intellectual Property Rights In Algorithms And Other Abstract Computer-Related Ideas*, 23 AIPLA Q.J. 401 (1995). These intellectual property rights are hypothetical, as yet, because under existing copyright and patent law, abstract ideas in principle unprotectable. Feist Pubs., Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 350 (1991) (discussing Baker v. Selden (Ichoemy); Baker v. Selden, 101 U.S. 99 (1879); Diamond v. Diehr, 450 U.S. 175, 185 (1981); *In re* Trovato, 42 F.3d 1376, 1381 (Fed. Cir. 1994), *vacated on other grounds*, 60 F.3d 807 (Fed. Cir. 1995).

[105] Procedural programming uses pure source code without any objects.

[106] The courts have refused to enforce software patents that merely claim mathematical algorithms, asserting that such algorithms are merely scientific principles and are therefore unpatentable subject matter under 35 U.S.C. § 101. *See* Park v. Flook, 437 U.S. 584 (1978); Gottschalk v. Benson, 409 U.S. 63 (1972); *In re* Grams, 888 F.2d 835 (Fed. Cir. 1989). Software inventors have avoided section 101 rejections by including elements other than pure scientific principles in the claim. *See In re* Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989); *In re* Bradley, 202 U.S.P.Q. (BNA) 480 (C.C.P.A. 1979).

[107] Stephens & Sumner, *supra* note 95, at 236.

[108] *Id.*, at 230.

[109] *Id.*

[110] *Id.*, at 249.

[111] The Federal Circuit took a step toward recognizing the importance of software function in *WMS Gaming v. International Game Technology*, 184 F.3d 1339 (Fed. Cir. 1999). The case involved a patent on a slot machine that decreased the probability of winning while maintaining the external appearance of a standard mechanical slot machine. The decreased probability of winning permits higher payoffs, which attracts players. The court held a lack of literal infringement, but the holding was not based on finding that the accused device lacks structure equivalent to that disclosed in the patent. On the contrary, the Federal Circuit sustained the district court's finding that the accused device had equivalent structure. The court reversed the district court's holding of literal infringement based on a lack of identity of function.

[112] In order to decide whether to use object-oriented programming, a common test in the industry is to balance "man-months" to "micro-seconds." In other words, programmers will balance the time it takes to write the code versus how long it takes for the chip to process the code. Source code without objects tends to take a long time to write, but the software will run fast. An object-oriented program generally takes less time to write, but the software will run slower. In short, more objects generally means slower software.

[113] Another good example where performance is essential is operating system software for a UNIX machine. The performance requirements for such software is so high that a programmer must go a step further to write portions of the code in assembly language, which a chip can read faster than source code.

[114] Novelty of an invention is determined by standards set forth in 35 U.S.C. § 102 (1994).

[115] *See* Shearing v. Iolab, 975 F.2d 1541, 1544 (Fed. Cir. 1992) ("[T]o prove anticipation [under 35 U.S.C. § 102(a)], Iolab must have convinced the jury with clear and convincing evidence at trial that Dr. Sincoe disclosed in advance of Dr. Shearing's invention *each and every element* of the '546 patent's claims.") (emphasis added).

[116] For history and a detailed discussion of how the difference is artificial, *see* Lawrence H. Pretty & Janene Bassett, *Becomeling Section 112, Paragraph 6 with the Doctrine of Equivalents in the Wake of Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 489 PLI/PAT 359, 378 (1997) (arguing that despite minor differences between the doctrine of equivalents and §112(6) equivalency, the two concepts have converged to involve virtually the same equivalence analysis).

[117] Polumbo v. Don-Joy Co., 762 F.2d 969, 975, n.4 (Fed. Cir. 1985).

[118] 520 U.S. 17 (1997). The Court focused its infringement analysis on whether the accused product or process contains an element identical or equivalent to each claimed element of the patented invention. In its decision, the Court instructed evaluation of the role played by each element in the context of a specific patent claim in order to inform the inquiry as to whether the substitute element matches the function, way, and result of the claimed element for purposes of the doctrine of equivalents. Furthermore, the Court held that the doctrine of equivalents is bounded not only by §112(6) or the Patent Act. Also, the doctrine of equivalents is not limited to equivalents disclosed in the patent itself. Moreover, the time for evaluation of equivalency under the doctrine of equivalents is at the time of infringement rather than the time of filing, as under §112(6). Further, the doctrine of equivalents does not require proof of intent.

[119] *See, e.g.*, Pretty & Bassett, *supra* note 116.

[120] Equivalency under §112(6) is measured as of the time the patent application is filed.

[121] For equivalence under §112(6), the claims and the accused device or process must have identical "function," and the specification and accused device or process must have substantially similar "structure" or "acts." For equivalence under the doctrine of equivalents, identical function is not required. Rather, each claim element is compared to the accused device or process for substantial similarity.

[122] 520 U.S. 17.

[123] 339 U.S. 605 (1950).

[124] Data Line Corp. v. Micro Technologies, Inc., 813 F.2d 1196 (Fed. Cir. 1987).

[125] Valmont, 983 F.2d 1039.

[126] *Warner-Jenkinson*, 520 U.S. at 39 ("There seems to be substantial argument that, while the tripartite test for the Doctrine of Equivalence (*sic*) may be suitable for analyzing mechanical devices, it often provides a poor analogy for analyzing other products or processes. On the other hand, the institutional differences test offers little additional guidance as to what might render any given difference 'insubstantial.'"); *see also Graver Tank*, 339 U.S. 605.

[127] See discussion of *Fonar* and *Robotic Vision*, *supra*.